



## Mineralogy and geochemistry of the IRG Misky gold deposit, southern Peru

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The Misky gold deposit is one of the several Intrusion Related gold deposits that occur in the ocoña river basin, southern Peru. They are hosted in magmatic rocks from the Nazca-Palpa-Ocoña belt, from the Coastal Batholith. In this study, a petrologic and geochemical characterisation of the host rocks of the Misky deposit is presented to contribute to prove the deposit model. XRD, electron microscopy and electron microprobe analyses were used to characterize the ore and major and trace elements of host rocks were analysed by ICP-MS.

The Misky deposit, Cretaceous in age, consists mainly in quartz veins of lenticular morphology that can be more than 3 Km long and less than 1 m wide.

At least two generations of magmatic host rocks are differentiated by the field relationships. The older generation is composed of plutonic rocks of the Incahuasi Unit constituted by diorites, quartz-monzonites, quartz-diorites and granodiorites in minor amounts. These rocks are crosscut by dykes of gabbro, tonalite and quartz diorite porphyries. Parallel to these dykes there is a NEE-SWW fault system. Gold veins are emplaced filling these fractures.

Gabbro is rich in hornblende and present titanite reaction rims around ilmenite, which suggests relatively reduced conditions and high H<sub>2</sub>O contents. Hydrothermal alteration, associated with the gold mineralization, produced sericitization, chloritization and silicification in the surroundings of the veins.

The Misky deposit has a Au-As-Pb-Zn-Cu association. Gold appears mainly in veins disseminated in the host rocks near the contact with these veins. Gold occurs as enclosed grains within pyrite, or as electrum located in fractures of pyrite. In addition other sulphides as sphalerite, galena and chalcopyrite are abundant. Arsenopyrite, sulphosalts, bismuthinite and native bismuth also occur in lesser amounts. Calcocite, malachite and hematite are supergene minerals. The gold content can reach up to 130 pp Au and up to 0.6 wt% Cu.

Major elements of the host rocks have a SiO<sub>2</sub> content from 49.02 to 60.81 wt % and Al<sub>2</sub>O<sub>3</sub> from 14.32 to 19.04 wt % (except one sample of 11.67 wt%. CaO can reach up to 9.34 wt%, Na<sub>2</sub>O up to 3.59 wt% and K<sub>2</sub>O up to 2.41 wt%.

Geochemically these rocks are I-type calcalkaline and metaluminous. The Nb/Y and Y+Nb/Rb diagrams indicate that these host rocks are related to a volcanic arc-setting and formed in post-collision environment.

Trace element patterns show LILE (K, Rb, Sr, Cs, Ba Be) and HFSE (Zr, Nb, Hf, Ta, Ti) depletion and enrichment for U, Th. Rocks from the late dykes are richer in REE. The chondrite normalised REE patterns show enrichment of the LREE and flattening of the HREE. Eu presents a positive anomaly for gabbro and diorite of the late dykes and does not show anomaly in the older rocks.

Petrologic and geochemical characteristics of the host rocks of the Misky gold deposit are in accordance with the suitable setting for the intrusion gold related deposits.